

# Glycoprotein May Explain Coffee-Diabetes Link

VITALS

**Major Finding:** Women who drank more than four cups of coffee daily were 56% less likely to develop type 2 diabetes than were those who drank no coffee, a significant difference. After adjustment for SHBG, the difference was not significant.

**Data Source:** Nested case-control study of 359 women with incident type 2 diabetes and matched controls from the Women's Health Study.

**Disclosures:** None. Study supported by a grant from the National Institutes of Health.

BY ROBERT FINN

FROM A CONFERENCE SPONSORED BY THE AMERICAN HEART ASSOCIATION

SAN FRANCISCO — Sex hormone-binding globulin may be the key to the protective effect of coffee consumption against type 2 diabetes, according to an analysis of the Women's Health Study.

Women who drank at least four cups of coffee per day were less than half as likely to develop diabetes, compared with those who drank no coffee. After adjustment for level of sex hormone-binding globulin (SHBG), the interaction disappeared.

It has been known for some time that women who drink coffee are significantly less likely to develop type 2 diabetes than are those who do not, and that the relationship between coffee consumption and diabetes is much less pronounced in men.

SHBG is a glycoprotein with a high affinity for testosterone and estradiol. SHBG levels tend to be substantially higher in women than in men, Atsushi Goto, a doctoral candi-

date at the University of California, Los Angeles, said at the conference. Previous studies have shown that variations in the genes controlling SHBG have a strong association with the development of diabetes and that coffee consumption increases plasma levels of SHBG.

To determine if SHBG is the link between coffee consumption and the development of diabetes, Mr. Goto and his colleagues used data from the Women's Health Study, in which nearly 40,000 women were followed for a median of 10 years. During that time, 359 of the women developed diabetes.

The investigators matched those women by age, race, and time of blood draw with 359 women who had not developed the disease.

After adjustment for age, smoking, alcohol consumption, physical activity, past use of hormone replacement therapy, total energy intake, fiber intake, body mass index, and plasma testosterone and estradiol levels, the investigators found that women who drank at least four cups of caffeinated coffee (500 mg caffeine) daily had significantly higher mean SHBG levels than did nondrinkers: 27.3 nmol/L versus 24.5 nmol/L. Consumption of decaffeinated coffee was not significantly associated with SHBG levels.

Furthermore, when controlling for all of the above factors plus education levels and family history of type 2 diabetes, the investiga-

tors found that women who drank at least four cups of caffeinated coffee daily were 56% less likely to develop diabetes than were nondrinkers.

However, when the investigators additionally controlled for plasma SHBG levels, the decrease in risk associated with coffee consumption became nonsignificant. This suggests that it is SHBG that mediates the decrease in risk of developing type 2 diabetes, Mr. Goto commented.



Women who drank at least four cups of caffeinated coffee daily had significantly higher mean SHBG levels.

## Bran Consumption Could Decrease Mortality in Diabetes

BY ROBERT FINN

FROM CIRCULATION: JOURNAL OF THE AMERICAN HEART ASSOCIATION

Consumption of whole grains, especially the bran component of whole grains, was associated with a significant decrease in the risk of all-cause mortality and cardiovascular disease-specific mortality in women with type 2 diabetes who were followed as part of the Nurses' Health Study.

After adjustment for age, women in the highest quintile of whole grain, cereal fiber, bran, and germ consumption had 16%-31% lower all-cause mortality than women in the lowest quintile, Dr. Meian He of the Harvard School of Public Health, Boston, and colleagues reported.

After further adjustment for lifestyle and dietary risk factors, only bran consumption remained significantly associated with mortality.

Compared with women in the lowest quintile of bran

VITALS

**Major Finding:** Women with type 2 diabetes in the highest quintile of bran consumption had a 28% lower risk of all-cause mortality and 35% lower risk of cardiovascular disease-specific mortality than women in the lowest quintile.

**Data Source:** Nurses' Health Study.

**Disclosures:** The study was funded by the National Institutes of Health, the American Heart Association, and the Boston Obesity Nutrition Research Center. The investigators reported that they had no other disclosures.

consumption, those in the highest quintile had a 28% decrease in the risk of all-cause mortality and a 35% increase in the risk of mortality associated with cardiovascular disease (Circulation 2010 May 25 [doi:10.1161/CIRCULATIONAHA.109.907360]).

"To my knowledge, this is the first study of whole grain and its components and risk of death in diabetic patients," Dr. Lu Qi, also of the Harvard School of Public Health and the study's senior author, said in a statement.

"These findings suggest a potential benefit of whole grain, and particularly bran, in reducing death and cardiovascular risk in diabetic patients," Dr. Qi said.

The Nurses' Health Study began in 1976 with 121,700 female registered nurses aged 30-55 years. Data on participants' medical history, lifestyle factors such as diet and activity level, and medical diagnoses have been updated every 2 years.

For this study, the investigators focused on 7,822 women diagnosed with type 2 diabetes between 1976 and 2006.

The researchers excluded women who had been diagnosed with diabetes before age 30 years and those with a history of cardiovascular disease or cancer reported on the 1980 questionnaire, when diet was first assessed.

Women completed semiquantitative food frequency questionnaires every 2 or 4 years between 1980 and 2002.

Investigators used data on how often they consumed certain foods and beverages to estimate each woman's average intake of whole grains, as well as her intake of bran and cereal fiber.

Investigators followed the women for 26 years, for a total of 70,102 person-years. During that time, 852 women died, and of these, 295 died of cardiovascular disease.

Investigators adjusted the data for age, smoking status, body mass index, alcohol intake, amount of physical activity, parental history of myocardial infarction, menopausal status, current and past use of hormone therapy, duration of diabetes, and various dietary factors including total calorie intake and intake of polyunsaturated fat, saturated fat, trans fat, magnesium, and folate.

Several different mechanisms could explain the association between bran consumption and mortality in women with diabetes, Dr. He and colleagues wrote.

Their earlier research suggested that consumption of whole grains might protect against systemic inflammation and endothelial dysfunction.

"Diabetes is thought to be a chronic state of inflammation characterized by moderately increased levels of chemical markers for inflammation and endothelial dysfunction," Dr. Qi said in the statement, which was issued by the American Heart Association, one of the study's sponsors.

"Those markers have been found to be related to increased risk of CVD in both diabetic and nondiabetic populations," Dr. Qi said.



After adjustment for lifestyle and dietary risk factors, bran consumption remained significantly associated with mortality.

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